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Research on Signal Processing Algorithm of Infrared Chemical Remote Sensing Based on Digital Filter

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Abstract

No matter which kind of signal transmission method, it has its own unique signal characteristics. It is precisely because of these signal transmission characteristics that people can process the signal by using advanced equipment, perhaps the signal source, signal strength The change may also be a change in signal emission. For chemical remote sensing signal processing technology, it is the development of sound generation signal feature extraction technology. At the beginning, based on the traditional chemical remote sensing signal processing thinking, the developers believed that the collected chemical remote sensing The signal should only be linear or Gaussian, but with the deepening of research and the continuous improvement of the equipment level, it is found that the chemical remote sensing signal in chemical remote sensing is interfered by many other external factors and the propagation process is not limited to only two signal characteristics. . Currently, there are mainly the following two methods in the feature extraction technology of sound emission signals. There are many signal processing methods, such as mean, mean square, variance, autocorrelation function and cross-correlation function. Other commonly used methods include support vector machines and artificial neural networks. Through the above analysis, it can be found that the kurtosis index is better for the early diagnosis of faults. Wavelet analysis is used more for fault diagnosis. Cepstrum is mostly used for speech recognition. Now it is getting more and more in the field of fault diagnosis. Many applications. It can be clearly found that different methods have different advantages and the appropriate method should be selected according to the specific conditions of the signal to achieve the best results.

Keywords: *Digital Filtering, Signal, Processing;*

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1. Introduction

We have a deeper understanding and understanding of the selection of facilities, the form of installation and the handling of abnormalities. It is clear that the system signal access should be based on its principles and actual needs to select a reasonable connection form, thereby ensuring the smooth progress of production and effectively improving the production efficiency of the device. It is captured by the chemical remote sensing signal system and then error interlock occurs, which brings unnecessary troubles and even losses to normal production and operation. Therefore, in the process of installation, wiring and debugging of the system, we must be careful and careful to prevent such problems and ensure the safety and stability of the production and operation process[1].

2. Digital filter mode

With the increasing use of various power electronic devices, AC power adjustment devices for industrial applications, such as rectifiers, electric arc furnaces, etc.; air conditioners, refrigerators, washing machines, etc. in household appliances, will generate a large number of harmonics, which

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seriously affect power quality. The problem of harmonics affects the processing of precision instruments, the heating of magnetic equipment and the accuracy of electric energy measurement. Whether it is an active power filter used for harmonic control or a metering device used for accurate measurement, it is necessary to calculate the fundamental wave component. This paper proposes a fundamental wave extraction algorithm based on Kalman filtering, which can calculate the fundamental wave components in real time and accurately. The Kalman algorithm is an optimal linear estimation with the minimum mean square error as the criterion. According to the previous observation data and the latest observation data, the current process state is estimated in real time using the state equation and recursive method[2]. Since all the information used is in the time domain, the limitation of filtering in the frequency domain is completely avoided and the scope of application is relatively wide. Remote sensing signal performance parameter estimation is an important part of the remote sensing signal health management system, which provides a basis for its health assessment and maintenance plan formulation. The current technologies used for remote sensing signal fault diagnosis are mainly: model-based diagnosis, signal processing, expert knowledge base and Based on machine learning, which is based on model diagnosis technology through diagnosis logic to realize fault judgment and prediction, which is widely used in the health management of remote sensing signals. In parameter estimation, it is difficult to find a strict recursive filtering algorithm and approximate methods are usually used to solve the problem of nonlinear filtering. One type of method is to find the linear approximation of the nonlinear function and linearize the nonlinear model: the extended elman filter (EKF) is obtained by Taylor expansion approximation and the differential filter (DDF) is obtained by interpolation polynomial approximation. Another type of method is based on the idea that it is easier to approximate the probability distribution of a nonlinear function than the function itself. A certain set of points is selected through UT transformation to represent the statistical characteristics of the state (such as mean and variance), which can be directly applied Non-linear model to solve, namely unscented Kalman filter (UKF). The latter calculation is longer and the real-time performance is poor. For this reason, this article chooses the extended Kalman filter method in the first method to estimate the parameters of remote sensing signals.This article chooses the extended Kalman filter and applies it to the remote sensing signal health parameter estimation. First, establish the remote sensing signal rotation trajectory model; second, use EKF to track the model and finally give the simulation results[3]. The signal processing system is in the figure below.

Figure1. Signal processing system.

3. Application of remote sensing signal

3.1. Application of remote sensing technology in geological survey

Actively apply remote sensing technology to land resource survey work, can quickly obtain the required data information and then build a complete land and resource management database, clarify the scope and location of the land and also provide assistance for the subsequent land survey and management. The development of the project has laid a good foundation and then the investigation can be completed by effectively collating the survey data and information. In addition, in order to study and analyze whether farmland planning and

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construction is scientific and reasonable, remote sensing technology is also indispensable. With the help of evaluation and monitoring results, timely adjustments to unreasonable farmland planning can be made to ensure the rational use of land resources[4]. The signal processing time system is in the figure below.

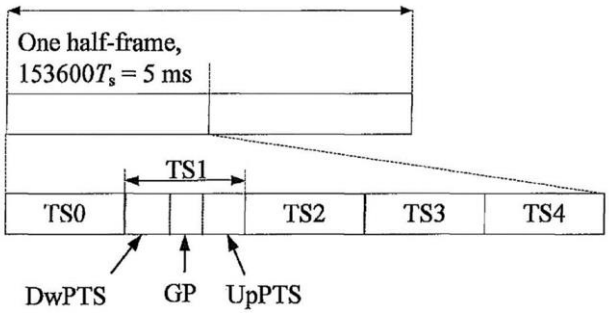

Figure2. Signal processing time system.

3.2. *Application of remote sensing technology in disaster prediction* Remote sensing technology also plays a very important role in the prediction of geological disasters and can realize effective monitoring and early warning. By analyzing the regional laws and reasons of geological disasters, the trend of subsequent disasters can be predicted more scientifically and reasonably. Relying on this advantage, remote sensing technology has been widely used in geological monitoring work, which not only reduces social and economic losses, but also better protects the lives and property of the people. The signal processing control system is in the figure below.

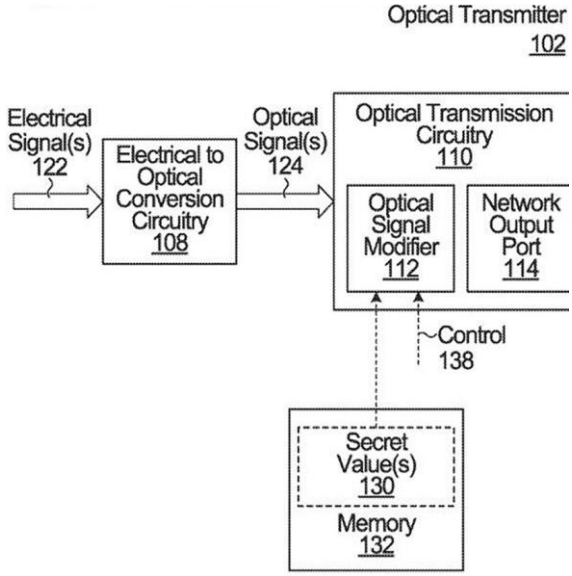

Figure3. Signal processing control system.

3.3. Application of remote sensing in information acquisition

With the help of remote sensing technology, the required applications can be obtained more quickly and comprehensively. As early as the last century, my country used satellite remote sensing data in the process of land surveys. By 1990, the application of aerospace remote sensing technology was gradually realized and multi-spectral qualitative description was realized. This fully reflects With the development and progress of remote sensing technology and with the continuous improvement of my country's technological level, remote sensing technology will be further developed and applied. The signal processing receive system is in the figure below.

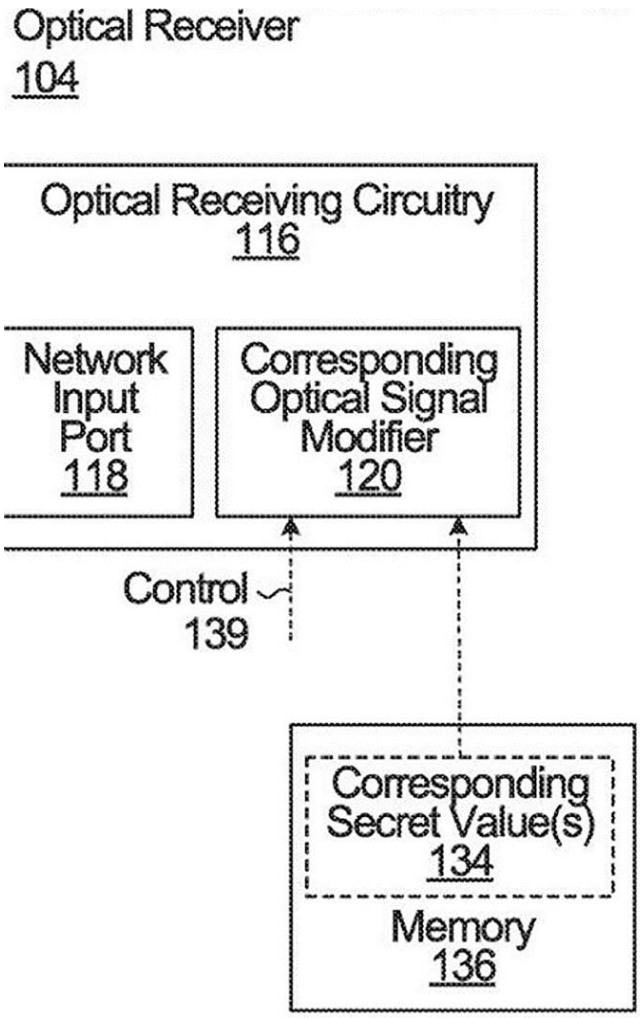

Figure4. Signal processing receive system.

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4. Remote sensing signal analysis and processing algorithm

4.1. Acquisition of geological structure information

Under normal circumstances, endogenous minerals are usually located in abnormal parts and marginal parts of geological structures and mineral resources are mainly distributed in the combined parts of different bodies of plate structures. These geological information can be detected by remote sensing geological survey technology. The spatial information can clearly detect the deposits in the boundary zone of the plate structure. When using remote sensing technology to extract geological marker information, generally select and detect linear and belt-shaped images with mineralization probability in the area. At the same time, in the process of obtaining geological structure information, the main ore-controlling structural module of faults and nappe The information is processed centrally[5].In the process of scanning geological information using electromagnetic and spectroscopy technology, due to the influence of various external and internal factors, part of the geological texture information and geological linear traces of image imaging are difficult to clearly display. The "fuzziness" of geological structure information can be processed by scientific methods such as expert visual interpretation or human-computer interaction and effective measures such as scientific computer image restoration technology or visual ratio analysis can be used to highlight key geological structure information. In the process of extracting geological structure information, remote sensing geological survey technology can use data such as surface lithology and geological features to extract the hidden information of geological structure. The signal processing system is in the figure below.

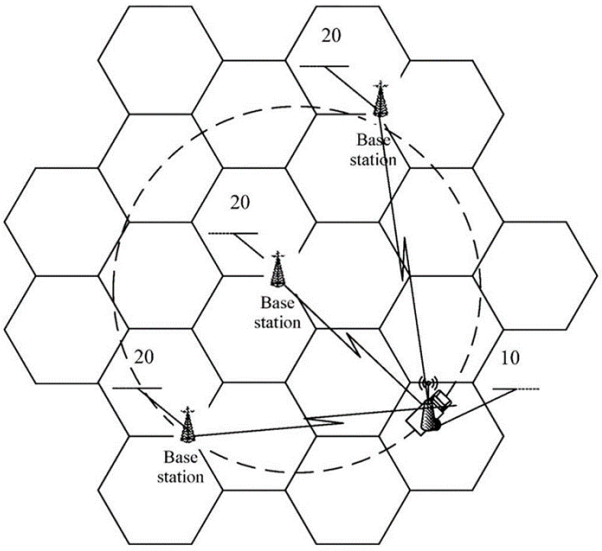

Figure5. Signal processing system.

4.2. Recognition using rock and mineral spectroscopy technology

Rock and mineral spectroscopy technology is the theoretical basis of remote sensing geological exploration technology. It is suitable for multispectral technology and hyperspectral technology. Through the extraction of multispectral alteration information, geological identification of lithology and hyperspectral minerals can be carried out. Due to the low spectral resolution of the multi-spectral technology, the spectral characteristics of the rock and mine are weaker. Therefore, the rock and mine spectral technology is mainly based on the image linear information and the gray-scale characteristics of the image to analyze the reflectivity difference of the rock and mine. Hyperspectral technology can obtain continuous spectrum information and intuitively identify geological types, which is the main feature that distinguishes it from multispectral technology. Rock and mineral spectroscopy technology can use multispectral technology and hyperspectral technology to effectively identify the types of rocks and minerals, identify the mineral alteration information directly related to mineralization, quantify the alteration intensity and provide technical support for geological exploration[6]. The signal processing connect system is in the figure

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below.

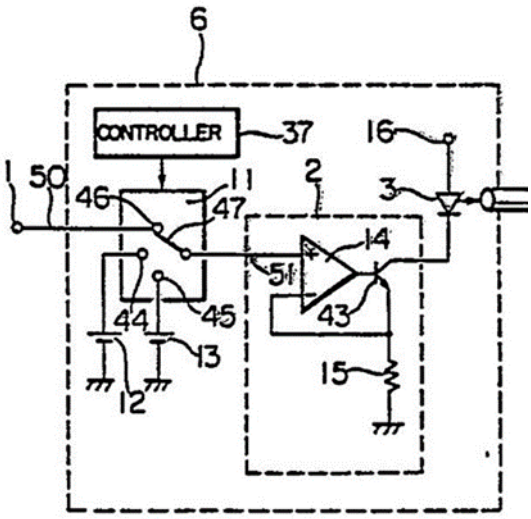

Figure6. Signal processing connect system.

4.3. Using vegetation spectrum characteristics for ore prospecting

Mineral resources are affected by groundwater microorganisms and other external factors, which may cause chemical reactions to the stored metal resources or mineral resources, causing structural changes in the surface layer to a certain extent and affecting the composition of the soil layer. Surface plants have different degrees of aggregation and absorption of mineral resources, which make the flourishing spectral characteristics of surface vegetation have different differences. Based on this feature, remote sensing geological survey technology can analyze the extracted vegetation spectrum abnormal information, effectively separate and extract the abnormal tones of the vegetation spectrum and reasonably determine whether there are minerals in the area based on the abnormal vegetation spectrum and improve the mine The accuracy of the target area survey work guides the development of related geological survey work. In view of the differences in the metal content of vegetation, relevant departments can collect detailed spectral characteristics of vegetation samples in established mining areas and use image processing technology to focus on analyzing relatively special vegetation spectra. In the process of spectral analysis, it is clear that the sensitivity of spectral testing technology is limited. It conducts an in-depth analysis of the weak metal content information of vegetation and scientifically judges whether there are mineral resources at that time based on the actual situation of local geology and geomorphology.

5. Conclusion

Chemical remote sensing signals will not be affected by loss and interference like analog signals during the transmission of digital audio systems. Therefore, many audio devices have begun to switch to digital output interfaces, such as CDs and DVDs. When the chemical remote sensing signal is transmitted to the digital audio receiver, it can encode the signal into a format supported by the DAP digital audio processor. In addition to devices such as CD and DVD, the audio signal will be encoded when it is played Becomes PCM data, which is a format supported by DAP and then converted into analog quantity for output drive after DAP processing. In summary, the chemical remote sensing signal processing digital filter module is the basis for digital audio processing and the digital filter module technology is of great significance to digital audio processing. Therefore, relevant staff should actively research the digital filter module technology for chemical remote sensing signal processing and apply it to the digital audio processing process to give full play to the advantages of the digital filter module, so that people can obtain better audio products. And then meet people's actual demand for audio products.

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